Notice of Allowability	Application No. 10/049,577	Applicant(s) KEAR ET AL.	
	Examiner Katherine A. Bareford	Art Unit 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the after final amendment of October 30, 2003*.
2. ☒ The allowed claim(s) is/are *1,3-16 and 18-28*.
3. ☒ The drawings filed on *19 September 2002* are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.
5. ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
   (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No. _____.
   (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
   (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1☐ Notice of References Cited (PTO-892)
2☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No. _____
4☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5☐ Notice of Informal Patent Application (PTO-152)
6☒ Interview Summary (PTO-413), Paper No. attached
7☒ Examiner's Amendment/Comment
8☐ Examiner's Statement of Reasons for Allowance
9☐ Other .

1.

EXAMINER'S AMENDENT

2. An extension of time under 37 CFR 1.136(a) is required in order to make an examiner's amendment which places this application in condition for allowance. During a telephone conversation conducted on Nov. 6, 2003, Mr. Paul Schwarz (Reg. No. 37,577) requested an extension of time for 1 MONTH(S) and authorized the Director to charge Deposit Account No. 50-2061 the required fee of $55.00 (small entity) for this extension and authorized the following examiner's amendment. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

IN THE CLAIMS:

1.(CURRENTLY AMENDED) A method for producing an abrasion resistant coating composed of a ceramic/metal material system or a ceramic/ceramic material system, the method comprising the steps of:

blending micron-scale particles of a hard phase material arranged in particle aggregates with nano-scale particles of a binder phase material to form a uniform powder mixture;

aggregating the powder mixture to bond the nano-scale particles to the micron-scale particles thereby forming a feedstock powder comprised of aggregated particles; and

thermal spraying the feedstock powder of particle aggregates onto a substrate thereby forming the abrasion resistant coating thereon, the coating composed of the micron-scale particles of the hard phase material fused together with the binder phase material.

2.(CANCELED)

3.(CURRENTLY AMENDED) The method according to claim ~~2~~ 1, wherein the particles are different sizes.

4.(ORIGINAL) The method according to claim 3, wherein the particles are different in composition.

5.(CURRENTLY AMENDED) The method according to claim ~~2~~ 1, wherein the particles are different in composition.

6.(ORIGINAL) The method according to claim 1, further comprising the step of agglomerating the powder mixture formed in the blending step prior to performing the aggregating step.

7.(ORIGINAL) The method according to claim 6, wherein the agglomerating step is performed by spray drying and the particle aggregates are each about 5 to 50 microns in diameter.

8.(ORIGINAL) The method according to claim 1, wherein the hard phase material includes one of a ceramic or a ceramic/metal composite.

9.(ORIGINAL) The method according to claim 1, wherein the binder phase material includes one of a metal, ceramic and ceramic/metal composite.

10.(ORIGINAL) The method according to claim 1, wherein the micron-scale particles of the hard phase material comprises between 50 and 90 volume percent of the blended powder mixture.

11.(ORIGINAL) The method according to claim 1, wherein the micron-scale particles of the hard phase material comprises 70 volume percent of the blended powder mixture.

12.(ORIGINAL) The method according to claim 1, wherein the aggregating step is performed by heat treating.

13.(ORIGINAL) The method according to claim 1, wherein during the thermal spraying step the nano-scale particles of the binder phase material are selectively melted, the melted particles filling pore spaces between heated and softened ones of the micron-scale particles, thereby effectively binding the micron-scale particles together and densifying the coating.

14.(ORIGINAL) The method according to claim 13, wherein during the thermal spraying step the melted particles experience a cooling rate which generates one of an amorphous nanocrystalline or microcrystalline binder phase.

15.(ORIGINAL) The method according to claim 1, wherein the ceramic/metal material system is selected from the group consisting of WC/Co, Cr_3C_2/NiCr, TiC/Fe, metal boride/metal, and metal nitride/metal and the ceramic/ceramic material system is selected from the group consisting of Al_2O_3, YSZ, Al_2O_3/TiO_2, ZrO_2/MgO, and Cr $_2O_3/SiO_2$.

16.(CURRENTLY AMENDED) A method of making a feedstock powder for use in producing thermal spray abrasion resistant coatings composed of a ceramic/metal material system or a ceramic/ceramic material system, the method comprising the steps of:

blending micron-scale particles of a hard phase material arranged in particle aggregates with nano-scale particles of a binder phase material to form a uniform powder mixture; and

aggregating the powder mixture to bond the nano-scale particles to the micron-scale particles thereby forming particle aggregates.

17.(CANCELED)

18.(CURRENTLY AMENDED) The method according to claim ~~17~~ 16, wherein the particles are different sizes.

19.(ORIGINAL) The method according to claim 18, wherein the particles are different in composition.

20.(CURRENTLY AMENDED) The method according to claim ~~17~~ 16, wherein the particles are different in composition.

21.(PREVIOUSLY AMENDED) The method according to claim 16, further comprising the step of agglomerating the powder mixture formed in the blending step prior performing the aggregating step.

22. (ORIGINAL) The method according to claim 21, wherein the agglomerating step is performed by spray drying and the particle aggregates are each about 5 to 50 microns in diameter.

23.(PREVIOUSLY AMENDED) The method according to claim 16, wherein the hard phase material includes one of a ceramic or a ceramic/metal composite.

24.(PREVIOUSLY AMENDED) The method according to claim 16, wherein the binder phase material includes one of a metal, ceramic and ceramic/metal composite.

25.(PREVIOUSLY AMENDED) The method according to claim 16, wherein the micron-scale particles of the hard phase material comprises between 50 and 90 volume percent of the blended powder mixture.

26.(PREVIOUSLY AMENDED) The method according to claim 16, wherein the micron-scale particles of the hard phase material comprises 70 volume percent of the blended powder mixture.

27.(PREVIOUSLY AMENDED) The method according to claim 16, wherein the aggregating step is performed by heat treating.

28.(PREVIOUSLY AMENDED) The method according to claim 16, wherein the ceramic/metal material system is selected from the group consisting of WC/Co, Cr_3C_2/NiCr, TiC/Fe, metal boride/metal, and metal nitride/metal and the ceramic/ceramic material system is selected from the group consisting of Al_2O_3, YSZ, Al_2O_3/TiO_2, ZrO_2/MgO, and Cr_2O_3/SiO_2.

29.(CANCELED)

30.(CANCELED)

31.(CANCELED)

32.(CANCELED)

33.(CANCELED)

3. This amendment provides an amendment identical to that filed by applicant on October 30, 2003, except that the amendment further provides original claim 22 to be present. This claim 22 was not present in the listing of claims provided with the October 30, 2003 amendment, thus making that amendment informal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (703) 308-0078. The examiner can normally be reached on M-F(7:00-4:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

KATHERINE A. BAREFORD
PRIMARY EXAMINER
GROUP ~~1100~~ 1700